Attny Docket No. S-0910-A (formerly RA-1728)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

INVENTOR: ERNEST L. JOHNSON	)	
APPLN. NO.: 10/715,584	)	
	)	GROUP ART UNIT: 3751
FILED: NOVEMBER 18, 2003	)	
	)	EXAMINER:
FOR: AUTOMATIC HAIR WASHING DEVICE	)	FETSUGA, ROBERT M.
	)	

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Sir:

DECLARATION UNDER RULE 1.1321

I, George A. Moran declare as follows.

1) I received a Bachelor of Science degree in Mechanical Technology from the University of Houston in December 1970, and received a license to practice engineering in the state of Texas in August 1975 (Professional Engineers license 38699). I received a Masters in Business Administration from the University of Houston in 1988.

2) I have worked in research and development and the design and engineering of new products for much of my career. I have been granted eight U.S. patents relating to mechanisms, seals, and flow control devices. I am a member of the American Society of Mechanical Engineers and the Society of Manufacturing Engineers. In my career I have

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also worked with instruments, sensors, and controllers, laboratory test instrumentation, and am rated as a Master Mechanic by Chevrolet Motor Division of the General Motors Corporation.

3) I was provided with a copy of the above patent application, as amended, and relevant excerpts of the examiners office action, and no other information. I have not met nor spoken to the inventor Earnest L. Johnson.

4) Based on my review of patent application number 10/714,584, it is my understanding that the Automatic Hair Washing Device consists of a cabinet with a hinged lid equipped with a flexible cover which fits around the face of the user to contain a spray of liquid within the cabinet. It is my further understanding that the liquid spray may consist of water or a mix of water and shampoo or water and hair conditioner. It is my understanding that the liquid spray is generated by a number of rotating nozzles arranged about the interior of the cabinet.

5) It is my understanding that the above mentioned patent application was rejected in that it is allegedly insufficient to enable one of ordinary skill in the art to design the nozzle and spray components using common techniques known at the time of the patent application filing. It is also my understanding that the invention not only must be disclosed in such full and clear terms as to enable a person skilled in the art to practice the invention without undue experimentation, but that the disclosure must be concise.

6) With the above considerations in mind, and based on my review of the disclosure in light of my own engineering, design, and testing experience; it is my opinion that the disclosure of the invention claimed in the Johnson application is enabling.

7) The patent application provides for multiple rotating nozzle assemblies as shown in Figure 6 of the patent application and which create a liquid spray. The liquid is supplied under pressure to the rotating nozzles (22) through a piping system (21). Each nozzle is equipped with a rotatable disk (22d) which has small openings drilled, cast, etc., through the disk. The openings are inclined at an angle, and as the water or the liquid mix is forced through the angled opening or jet (22b) by the fluid pressure in the pipe, the disk is forced to rotate and the liquid exits the jet as a spray.

8) The literature in the field of engineering Fluid Mechanics documents examples and provides the necessary calculations for design of turbo-machinery for both compressible and non-compressible fluids (1, 2). Examples of rotating turbo-machinery include the impulse turbine, the reaction turbine, and the centrifugal compressor. All are readily designed and engineered to a particular specification or to provide a design solution. A common example of reaction with rotation is that of the familiar lawn sprinkler as depicted in Appendix A.

To elaborate, the nozzle assembly (22) depicted in Figure 6 of the patent has characteristics of a reaction turbine. In this case, the liquid under pressure passes through the angled hole or jet (22b) in the disk (22d) to provide rotation. As the liquid is vented through the angled hole, a rotating jet (22b) is created and is directed along the axis of the hole. The angled holes in the rotating disk of the nozzle take the place of the arms of the rotary lawn sprinkler shown in Appendix A.

9) In summary, it is my opinion that the Johnson patent application provides ample information to a typical engineer trained in the art to make the claimed assembly. The

final detailed design configuration would depend more on cost, and the available material, manufacturing facilities, and equipment.

Respectfully submitted,

George A Moran

George A. Moran, P.E.

REFERENCES:

1) Daugherty, Robert L., FLUID MECHANICS WITH ENGINEERING APPLICATIONS, 6th Edition, 1965, McGraw-Hill Book Company, NY.

2) MARKSâ€ ™ STANDARD HANDBOOK FOR MECHANICAL ENGINEERS, 9th Edition, 1987, McGraw-Hill Company, NY.

APPENDIX A

Example Of Reaction With Rotation
Reference 1, Chapter 6, Section 6.14.

6.14. REACTION WITH ROTATION

The force of reaction of a jet from a stationary body is given in Sec. 6.6 and from a body in translation in Sec. 6.10. Since Sec. 6.13 develops the equation for the flow through a channel in rotation, we are now ready to consider the force of reaction of a fluid discharged from a rotating body.

A familiar object to illustrate this subject is the rotating lawn sprinkler. In Fig. 6.16 assume that the cross-sectional area of the arms is so large relative to the area of the jets that fluid-friction loss in the arms may be neglected. Water enters at the center, where $r_1 = 0$, so that in Eq. (6.20), $u_1 = 0$. With the sprinkler arms lying in a horizontal plane, $z_1 - z_2 = 0$, and for the jets discharging into the air, p_2 is atmospheric pressure and will be regarded as zero. Since friction is neglected, $h_L = 0$, and if we let $h = p_1/\gamma + v_1^2/2g$, Eq. (6.20) applied to Fig. 6.16 becomes

$$v_2 = \sqrt{2gh + u_2^2} \tag{6.23}$$

If a_2 denotes the sum of the areas of all the jets (two in the figure shown), then $Q = a_2 v_2$. This shows that the discharge is a function of

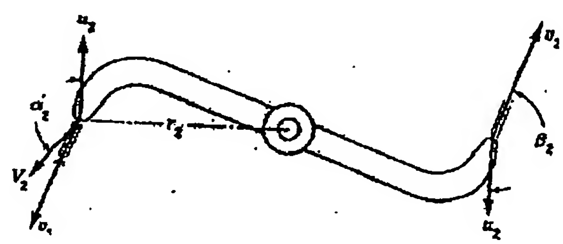

Fig. 6.16

the rotative speed, since $u_2 = r_2\omega$. The tangential component of the absolute velocity of discharge is $V_u = u_2 + v_2 \cos \beta_2$ and hence the tangential component of the force of reaction is

$$F_u = \frac{\gamma Q}{g} \Delta V_u = \frac{\gamma a_2 v_2}{g}(0 - V_u) = -\frac{\gamma a_2 v_2}{g}(u_2 + v_2 \cos \beta_2)$$

As the radius is a factor in any rotating body, it is usually better to compute torque rather than a force. In this case the torque is

$$T = F_u r_2 = -\frac{\gamma a_2 r_2}{g} v_2(u_2 + v_2 \cos \beta_2) \tag{6.24}$$

The ideal maximum, or runaway, speed is when $T = 0$, and this will be the case when $u_2 = -v_2 \cos \beta_2$ and when $V_2 \cos \alpha_2 = 0$ or $\alpha_2 = 90°$. Because of mechanical friction this condition will never be realized. Of the total power supplied to the sprinkler, the greater part is lost in the kinetic energy of the jets. The total power *developed* by the sprinkler is used in overcoming its own friction. If there were more arms, with larger orifices, so as to discharge more water, there could be a surplus of power which would be useful power delivered. A primitive turbine constructed in this manner was known as Barker's mill.